

# (12) United States Patent

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## (54) HIGH CAPACITY MAGNETIC ANNEALING SYSTEM AND METHOD OF OPERATING

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(52) U.S. Cl.

CPC ...... F27B 1/10 (2013.01); H01L 21/67103 (2013.01); H01L 21/67303 (2013.01); H01L 21/67751 (2013.01); H01L 21/68707 (2013.01); H01L 2221/683 (2013.01)

(58) Field of Classification Search CPC ...... H01L 21/67115

See app.	lication	file for	comp	lete	search	histo

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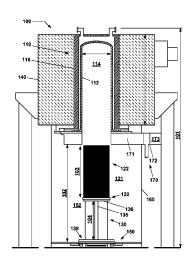
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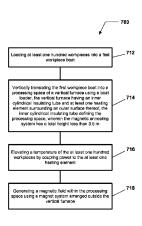
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#### (57)ABSTRACT

An annealing system and method of operating is described. The annealing system includes a vertical furnace having an inner cylindrical insulating tube and at least one heating element surrounding an outer surface thereof, wherein the inner cylindrical insulating tube defines a processing space into which a plurality of workpieces may be vertically translated and subjected to thermal and/or magnetic processing. The annealing system further includes a workpiece boat for carrying at least one hundred workpieces, a boat loader arranged beneath the vertical furnace, and configured to vertically translate the workpiece boat and position the workpieces within the processing space, and a magnet system arranged outside the vertical furnace and configured to generate a magnetic field within the processing space.

## 21 Claims, 7 Drawing Sheets





<sup>\*</sup> cited by examiner